

REMARKS

Applicant respectfully requests reconsideration of the above-identified application in view of the foregoing amendments and following remarks.

Status of the Claims

Claims 1, 12-25, 35-50 and 60-66 are pending in this application, of which claims 1, 25 and 50 are independent. All of the pending claims stand rejected. By this amendment, independent claims 1, 25 and 50 are amended. Dependent claims 12-24, 35-49 and 60-66 are also amended for consistencies with the amended independent claims. No new matter has been added by this amendment.

Rejections under 35 U.S.C. §103

Claims 1, 11-12, 14, 22-25, 35-36, 38, 46-50, 60, 61, 63, 64 and 66 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,949,424 to Cabral et al. ("Cabral") in view of U.S. Patent No. 5,566,283 to Modegi et al. ("Modegi"). Further, claims 13, 15-21, 37, 39-45 and 62 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Cabral and Modegi in view of U.S. Patent No. 6,256,038 to Krishnamurthy ("Krishnamurthy"). Claims 23, 47 and 65 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Cabral and Modegi in view of U.S. Patent No. 6,175,368 to Aleksic et al. ("Aleksic").

Independent claims 1, 25 and 50 have been amended for further clarification. The three-dimensional data processing method according to amended claim 1 "acquires" three-dimensional image data and three-dimensional shape data of a real existing object by taking images of the object with, e.g., a digital still camera. The method of amended claim 1 also "generates" a polygon mesh based on the three-dimensional shape data that shows a simplified shape of the

surface of the object. The method of amended claim 1 then "estimates" surface reflectance properties of the object based on the three-dimensional image data as well as the polygon mesh thereby "generates" a bump map. The method of amended claim 1 then "reproduces" the image of the object with a computer graphic based on the generated polygon mesh and the bump map. Each of claims 25 and 50 as amended incorporates similar features to amended claim 1 discussed herein. Support for the amendment may be found throughout the specification as originally filed including, e.g., paragraphs [0055] through [0119].

One of the aspects of the present invention is using intermediate steps to reproduce the image of an object with a computer graphic thereby reducing the amount of calculation necessary to achieve the three-dimensional graphic image. For example, instead of directly handling the acquired three-dimensional image data and shape data to reproduce the three-dimensional image of an object, the method generates an intermediate model such as the polygon mesh that shows a simplified surface shape of the object and estimates surface reflectance properties based on the generated polygon mesh and acquired three-dimensional image data to generate a bump map. Additionally, the acquired shape data is used only by generating the polygon mesh, not by generating the bump map, thereby further reducing the necessary calculation. See, e.g., paragraph [0071] of the original specification.

Cabral discloses a method (system) for an accelerated shading of an object surface by a bump mapping in a tangent space. In an effort to reduce the calculation by the Phong shading hardware and improve the speed for a computer-generated image, Cabral converts the three-dimensional shading processing of a fine detailed lighting into a two-dimensional processing. See, e.g., col. 2, lines 52-60. Referring to Fig. 1 and 2A, Cabral builds a tangent space transform matrix M (step 230), and transforms the lighting and viewing vectors to the tangent space vectors

(step 240). Cabral then interpolates and normalizes the transformed vector on a per-pixel basis (steps 250 and 260). However, there is simply nothing in Cabral that teaches the processing method of amended claim 1 discussed above including the steps of acquiring, generating and estimating.

Regarding the secondary reference, the Examiner indicates that “Modegi discloses bump map as a component of surface reflectance (note col. 10, lines 9-15).”¹ Applicant notes that a portion of Modegi (i.e., col. 10, lines 39-43) discloses a combination of “surface reflectance” and “texture map”. However, as Applicant understand it, Modegi including the cited portion by the Examiner does not show or suggest a combination of “bump map” and “surface reflectance”, as required by the present invention.

Similarly, other cited references (i.e., Krishnamurthy and Aleksic) also fail to show or suggest the inventive aspects of the present invention as featured in the amended claims.

Accordingly, each of claims 1, 25 and 50 as amended is believed neither anticipated by nor rendered obvious in view of the cited references (i.e., Cabral, Modegi, Krishnamurthy and Aleksic), either taken alone or in combination, for at least the reasons discussed above.

Reconsideration and withdrawal of the rejections of claims 1, 25 and 50 under 35 U.S.C. §103(a) is respectfully requested.

Applicant has chosen in the interest of expediting prosecution of this patent application to distinguish the cited documents from the pending claims as set forth above. However, these statements should not be regarded in any way as admissions that the cited documents are, in fact, prior art.

¹ Page 3 of the Office Action.

Also, Applicant has not individually addressed the rejections of the dependent claims because Applicant submits that the independent claims from which they respectively depend are in condition for allowance as set forth above. Applicant however reserves the right to address such rejections of the dependent claims should such be necessary.

Applicant believes that the application as amended is in condition for allowance and such action is respectfully requested.

AUTHORIZATION

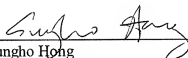
A petition for a one-month extension of time along with the associated fee is enclosed, extending the date for responding until November 11, 2008. Should an additional extension of time be required to render this paper timely filed, such extension is hereby petitioned and the Commissioner is authorized to charge any other fees necessitated by this Amendment, or credit any overpayment to our Deposit Account No. 13-4500 (Order No. 1232-5285). A DUPLICATE COPY OF THIS SHEET IS ENCLOSED.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,
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Dated: November 10, 2008

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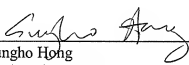
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